

TECHNOLOGY DEPT

15¢

October 6, 1951

SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Talent Search Winner

See Page 218

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TECHNOLOGY DEPT
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Co-operation with Schools to Stimulate Interest of Graduate Students

To gain valuable industrial experience before starting to study for his Doctor's degree, Robert D. Haberstroh worked at the Westinghouse Research Laboratories during his 1950 vacation. He is shown preparing to run a test on a combustion chamber for a gas turbine. Mr. Haberstroh, a native of Johnstown, Pa., was graduated under the George Westinghouse Scholarship Program from Carnegie Institute of Technology last year with a Bachelor's Degree in mechanical engineering.



For more than half a century, Westinghouse has placed major emphasis on co-operating with educational institutions in the process of building men for positions of leadership. It was a pioneer in providing orientation and training programs for newly employed college graduates and in offering all employees opportunities for advanced degree work in co-operation with local universities. It has also been a leader in encouraging higher education in science and engineering through a large-scale program of scholarships and fellowships.

One of the latest additions to this broad program is a plan to co-operate with engineering schools in their advanced work by supplementing technical training with actual research experience.

Through this plan, selected students in graduate schools who are interested in the field of

research are given the opportunity to get practical laboratory experience. During summer months, 10 outstanding students selected from engineering schools are given the opportunity to gain experience in the Westinghouse Research Laboratories.

Working beside seasoned research people, these young scientists gain firsthand experience in industrial research practices and techniques. Besides gaining much practical experience and valuable counsel, they earn while they learn.

Through this co-operation with colleges, Westinghouse hopes to aid students in choosing the scientific field they should enter, and, at the same time, strengthen their foundation for graduate school work.

Westinghouse Electric Corporation, Pittsburgh, Pennsylvania.

G-10138

YOU CAN BE SURE..IF IT'S Westinghouse

GENERAL SCIENCE

Defense Blood Factory

Every man and woman in the United States is on 24-hour shift for a vital defense product—good red blood, essential both for overseas and home use.

► EVERY MAN and woman in America is a walking factory for a vital defense product. It is a product that no other factory can turn out. Maybe you can guess what it is—good red blood.

Blood is needed for our troops overseas and for the civilian population at home in case of disasters, from atomic bombing to fires or traffic accidents.

Our blood banks operating under the National Blood Program are running dangerously low. But our human blood factories are operating on their regular 24-hour, seven-day-a-week shift.

Blood factories in the human body are located in the marrow of the bones and in the liver, spleen and lymph nodes, or glands. You put raw materials into them every time you take a drink of water and eat a meal of vegetables and meat or eggs or fish or poultry or cheese or other protein food.

When the food is digested, some of the protein building blocks, called amino acids, go to the bone marrow for manufacture into red blood cells that carry oxygen from the lungs to every part of the body. Some is made into white blood cells that help defend the body against disease germs. Some goes to the liver, spleen and lymph nodes to be made into proteins for the fluid part of the blood, or plasma. These plasma proteins also help fight disease germs.

The human blood factory constitutes a first line of defense when blood and plasma are needed for the wounded. Substitute fluids, made in non-living factories from synthetic chemicals or from a sugar by-product, are at best only a second line of defense. They can keep fluid in the veins and thus help fight shock temporarily. But they cannot carry vital oxygen or supply nourishment or raw materials for making more blood.

Giving blood at one of the National Blood Program collection centers or to one of its Bloodmobiles is a painless procedure. A prick of a tiny needle, no worse than all of us get from time to time from a sewing needle or pin, is all that is felt. This tiny needle is used to inject a bit of pain-killing medicine called procaine. When that has taken effect, the larger blood-collecting needle is injected.

For those who dread even a slight needle prick, a newer spray method of injecting the pain-killing medicine may be available some day. At present scientists are working to perfect this for the blood program. One of the problems to be solved is that of getting the procaine the right depth into

the body, so it will be where it is needed to stop the pain of the larger needle.

The human blood-making machine on its round the clock daily production schedule makes blood so fast that a person will have enough to give a pint safely every two months.

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PHYSIOLOGY

Jet Pilots Bailing Out High Should Hold Chute Opening

► JET PILOTS who are forced to jump from planes when they are several miles above the earth should wait a bit before opening their parachutes.

This advice from six physiologists of the U. S. Air Force School of Aviation Medicine in San Antonio results from their studies of man's reaction to the 65 degrees

below zero Fahrenheit temperatures found at 50,000 feet. It is better, they conclude, to fall fast through this dangerously cold atmosphere, waiting until the air is warmer before pulling the ripcord.

American medical records show only five fully-reported cases of flyers who abandoned their planes at 38,000 feet or higher. So at the Eglin Air Force Base near Pensacola, Fla., the medical men tried to set up the conditions a pilot would meet after leaving his plane at 50,000 feet.

They tested 79 volunteers for three minutes at a time in winds ranging from 115 to 125 miles per hour with the temperature at minus 65 degrees. Wearing flying suits of various weights, the subjects hit the blast in different positions such as those a falling body might assume. Some were turned over and over on a rack to simulate tumbling. In a number of tests they breathed air low in oxygen, as a pilot would if he had a leaking mask.

Skin temperature, blood pressure, heart beat and respiration measurements showed that the men suffered no injuries from the exposure to super-icy winds, although some of them did report a good deal of discomfort from the cold.

The six physiologists, all from the School of Aviation Medicine, were Drs. Albert W. Hetherington, now at Carswell Air Force Base at Fort Worth, Texas, Louis E. Moses, Ulrich C. Luft, Syrrrel S. Wilks, Henry B. Hale and Hans-Georg Clamann.

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INVENTION

Telephone Talk Carried on Away From Phone Set

► THE OFFICE man with a tiny sound wave receiver in his ear will be able to carry on a telephone conversation from most any place in the room by means of a special telephone set on his desk but without wires connecting the set to him or to the gadget in his ear.

The inventor is Ralph K. Potter, Morristown, N. J. His award was patent 2,568,823. Rights are assigned to the Bell Telephone Laboratories, Inc., New York City.

The telephone terminal on the desk picks up the incoming telephone conversation, converts the sound waves into ultrasonic waves too high in pitch to be audible by the normal ear, and radiates these ultrasonic waves into space. The gadget in the ear, which uses no other power than that provided by the sound waves, picks them up and converts them back again into audible sound waves to beat on the eardrum.

No one in the room can hear the incoming conversation without a capsule detector in his ear. The return conversation is, however, audible to others. The user speaks in an ordinary voice directed toward the telephone terminal. A microphone in it picks up the sound waves, amplifies them greatly, and passes them on to the telephone circuit.

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DRESSED FOR 50,000 FEET—Dr. Albert Hetherington of the Air Force School of Aviation Medicine shows here the proper attire for pilots who will be tossed around by 125-miles-per-hour winds at 65 degrees below zero Fahrenheit.

MEDICINE

Aorta Ruptures in Crashes

➤ CAUSE OF death in a third of the victims of air-crashes may be rupture of the aorta, biggest artery of the body that comes directly from the heart.

This very unusual injury was the cause of death of eight of 28 victims of one big airliner crash, a pathologist, Dr. Donald Teare, of St. George's Hospital Medical School and St. Bartholomew's Hospital Medical College in London, found when he performed the post mortem examinations on the bodies of the victims.

Ruptured aorta due to an injury is so rare as a cause of death that Dr. Teare had seen it only three times in 25,000 post mortem examinations, and one of these three was the radio operator of another plane that had crashed.

Broken ribs, disruption of chest muscles, broken spines, and tears and bruising of the liver were found with the ruptured aortas.

These injuries, in Dr. Teare's opinion, were caused by acute bending of the body

over the safety-belt. A similar mechanism could well have accounted for the findings in the eight victims who died of tears of the heart, lungs, liver or spleen.

Injuries of these types, he believes, might have been avoided if the passengers had been sitting with their backs "to the engine" and supported by cushioned upholstery.

Sitting in the tail of the plane may also lessen the chance of serious injury or death in event of a crash, he suggests. This is borne out by the escape of a steward in one crash he reports and a stewardess in another, both of whom were in their "correct positions in the tail of the aircraft."

Although in one of the crashes the plane burned, Dr. Teare's findings showed that all the victims were either dead before the fire broke out or were unconscious and lived only a matter of seconds in the fire.

Dr. Teare reports his findings in the *BRITISH MEDICAL JOURNAL* (Sept. 22).

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RADIO

Radar Tracks Rockets

➤ AS TEST rockets roar through the sky above White Sands Proving Ground in New Mexico, radar experts are learning how to protect the country from enemy guided missiles.

This is an important by-product of the necessity of keeping track of the rockets as they travel more than 100 miles into the sky. The job of stalking the guided missiles is told by two Aberdeen Proving Ground scientists, Dr. Dirk Reuyl and L. G. de Bey in the magazine *ORDNANCE* (Sept.-Oct.).

All kinds of telescopes, most of which take pictures, and many kinds of radar equipment are used to keep track of the rockets from the moment of takeoff until the final landing. For safety's sake, a series of radars tracks the rocket and can predict its point of impact with the earth. If the rocket is straying outside of the range, it can be exploded in the air before it lands.

Although it was not stated in the article, it does not take much imagination to visualize a little additional equipment designed

to pick up an enemy rocket. It can then be tracked with great precision with some of the equipment now in use at the White Sands Proving Ground.

Right now, detailed records are needed of the flights of these test rockets. An electronic telemetering system in the rocket samples 30 different measuring instruments 30 times a second and transmits the data to the ground. Another system, based on frequency modulation, transmits up to 14 continuous measurements back to the earth-bound scientists.

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METEOROLOGY

U. S. To Probe Rainmaking

Study will tell whether those who have been buying rain have been gypped. Total rainfall measurements over 17 western states, including seeded areas, will be made.

► THE U. S. Weather Bureau is embarking on a study to find out whether thousands of farmers and ranchers in 17 western states who contracted for rainmaking on 300,000,000 acres at a cost of more than \$3,000,000 this year got their money's worth.

The study will measure actual rainfall over the whole area and actual rainfall over the areas where clouds were seeded to produce rain. These seeded areas amount to about 13% of the total area of the nation. Rainfall in seeded areas will be compared with normal rainfall expected in the areas as well as rainfall in unseeded areas.

Thousands of ranchers, farmers and cattlemen in the West have banded together to pay for artificial increase in rain—mostly with the Water Resources Development Corp., Pasadena, Calif., of which meteorologist Irving P. Krick is the head. Other farmers have bought generators of their own, and small companies are operating over the entire West.

Meantime, other attempts to evaluate the work of the rainmakers will be going on. Already, scientists at Colorado A. and M. have reported that seeding in a test area in northern Colorado produced no apparent increase in rainfall. The University of Wyoming is launching a study of rainmaking in that state and the California legislature has appropriated \$50,000 for a study of the effects of cloud-seeding.

In many areas in the West, there is some dissatisfaction with the rainmakers, but not, apparently, based on a disbelief in their ability to make rain. Some farmers who want dry weather for particular crops, object to the farmers and ranchers who band together to pay for rainmaking efforts.

However, in New Mexico, where Dr. Krick claims the entire state is under contract to him, promises that the drought would be broken before the end of July were not kept. Dr. Krick explained that he could only increase the natural amount of rain when there were clouds to seed. He pointed out that there had been no clouds.

On the other hand, Dr. E. W. Workman, president of the New Mexico School of Mines, originally an enthusiast for cloud-seeding, has become much more conservative about the possible effects of injecting silver iodide particles into clouds.

Weather Bureau scientists point out that rainfall varies so much from season to season and from area to area that it will be difficult to provide a definitive answer to the questions connected with rainmaking

until ten or so years have gone past. However, they believe they can come up with a partial answer when this survey is finished.

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MEDICINE

Ready Cobalt 60 Machine For Treatment of Cancer

► HIGH-POWERED radiation treatment of cancers deep within the body will be available in more hospitals throughout the country in the future, thanks to development of a machine for using radioactive cobalt in the way X-rays are now used.

First such machine, called the cobalt 60 cancer tele-therapy unit, was shown to radiologists at the meeting of the American Roentgen Ray Society in Washington.

Cobalt 60 is made by irradiating ordinary cobalt in an atomic pile at Oak Ridge, Tenn. Heretofore it has been used in so-

called needles, to be inserted surgically in the body, and in nylon thread stitched in place for treatment of skin and other superficial cancers.

With the new machine, the high energy radiation of radioactive cobalt is used at a distance from the patient, as X-rays are. The cobalt 60 machine gives radiation equivalent to that from a two-million-volt X-ray machine, but will do it less expensively. The cost of the new machine has not been released by its manufacturers, General Electric, but the cost of the cobalt is estimated at \$18,000. Enough radium to do the same job would cost \$26,000,000.

The cobalt unit head is only three feet long and 13 and one-half inches in diameter. Heart of the machine consists of four "wafers" each about an inch square and three-eighths of an inch thick. After irradiation for about a year in the pile, the radioactive cobalt wafers are loaded by remote control, under nine feet of water, into the container for the treatment machine.

Collaborating with General Electric in developing this new cancer-fighting weapon were the late Dr. Leonard G. Grimmett, British-born physicist, and the M. D. Anderson Memorial Hospital at Houston, Tex., where it will soon be installed, the Atomic Energy Commission, the Oak Ridge Institute for Nuclear Studies and the Damon Runyon Memorial Fund for Cancer Research.

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COBALT 60 MACHINE—Shown here is General Electric's tele-therapy unit—a machine that, instead of X-rays, uses four tiny "wafers" of radioactive cobalt giving off high-powered, penetrating radiation. Enough radium to give off the same amount of radiation would cost \$26,000,000. Cost of the cobalt wafers is estimated at \$18,000.

MEDICINE

Cortisone Helps Skin

► HERE'S A new possibility for cortisone: the treatment of acute skin diseases.

The drug has been used in such experiments by Dr. Thomas H. Sternberg and Victor D. Newcomer of the University of California at Los Angeles Medical School.

It has been found effective in relieving neurodermatitis and certain skin allergies. When treatment is stopped, however, complete relapse usually occurs.

"This kind of treatment for skin diseases is still very much in the experimental stage," they emphasize. "It should be used with great caution because of possible harmful effects still not known."

The most disappointing feature of cortisone therapy for skin diseases was the mental depression accompanying relapse.

In explanation they said that patients were elated over finding a long hoped for cure for their affliction. Then, when cortisone therapy was discontinued and the relapse occurred, they requested or demanded more cortisone. When it was not given, they became morose and depressed.

"At the present state of our knowledge of cortisone treatment, we believe that it has a limited usefulness, namely, in the control of severe cases which have occurred despite the use of all conventional methods of therapy," said Dr. Sternberg.

"Even in these instances, the drug should be discontinued as soon as possible. We also believe cortisone should not be used in mild or moderate cases of skin disease."

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METEOROLOGY

New Rain Forecast System

► A NEW system of forecasting whether it will rain "day after tomorrow"—already in operation in the Washington-Baltimore area for the three winter months—will be used during the month of October. It promises a considerably greater degree of accuracy than was achieved before.

In tests, the system, described by R. C. Schmidt, a forecaster at the Weather Bureau's National Airport station in Washington, has worked out to an accuracy of 90% correct.

Mr. Schmidt and other forecasters have been working on application of the method to other months of the year and, before long, it is expected that the system will be in use the year round not only in Washington, but also in the area made up of Tennessee, Kentucky, Ohio, Virginia, West Virginia, Pennsylvania, Maryland, Delaware, New Jersey and New York.

The system, as applied to October, uses the same fundamental principles as are

used to forecast rain day after tomorrow in the three winter months. The forecasters determine the variables in the weather pattern over a wide area of the nation which usually produce rain in Washington and Baltimore.

However, for October, it was found best to discover those variables in the weather pattern which usually prevented rain. When those were present, a "no rain" prediction is made, when they are not "rain" is predicted. It works 90% of the time.

The flow of the weather and the atmospheric pressure at Nashville, Tenn., Sault Ste. Marie, Mich., and Washington enter into determining whether or not it will rain in Washington and Baltimore the day after tomorrow.

Mr. Schmidt describes the new system in the Weather Bureau's MONTHLY WEATHER REVIEW (June).

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SURGERY

Ream Out Blood Clots

► A TECHNIQUE for reaming out clots, calcium deposits and the entire linings of major blood vessels in patients with hardening of the arteries was reported by two University of California School of Medicine surgeons at the International Surgical Society meeting in Paris.

The technique is an improvement on an operation first developed by French surgeons and reported three years ago. The Californians reported the first American use of the operation, in 20 patients, on one-fourth of whom the improved technique was used.

The French surgeons originally found that it was possible to slit arteries lengthwise, ream out the diseased lining, sew the remaining outer wall together again, and restore circulation in many cases in which clots had caused heart attacks. However, clots reformed in some cases.

The California surgeons transplant a tough sheath of tissue from the leg, wrapping it around the reamed arterial wall. This prevents bleeding through the wall, strengthens the blood vessel, and makes the operation safer. Local use of heparin reduces reformation of clots.

In some of the California cases, the abdominal aorta, the big vessel leading from the heart to the lower extremities, has been reamed out successfully. In two cases gangrene had started because of lost circulation to the lower extremities. The operation restored circulation and the gangrenous limbs recovered. Gangrene usually has meant amputation.

The surgeons, Drs. Jack Wylie and Orland Davies, expressed the opinion that the procedure will find increasing use in the treatment of clots in hardening of the arteries.

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PUBLIC HEALTH

Nation's First EI Men Ready to Fight BW

► THE NATION'S first EI men have taken up their stations and now stand guard against germ warfare if it should be used against us.

The EI men are officers of the U. S. Public Health Service specially trained for its newly organized Epidemic Intelligence Service. Besides being prepared to detect and help fight germ warfare used by an enemy, they will assist in any disease outbreaks that get beyond the resources of state and local health departments to control.

The 21 EI men have been assigned to posts in the following 12 states: Arizona, California, Georgia, Kansas, Louisiana, Maryland, Massachusetts, New York, Ohio, Pennsylvania, Texas and West Virginia.

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INVENTION

Lightweight Aggregate From Volcanic Ash

► A LIGHTWEIGHT aggregate to replace the usual heavy gravel used in making concrete is made by treating certain by-products of the phosphate mining industry but can use similar material from other sources. The material is a phosphatic volcanic ash.

This by-product of the pebble phosphate deposits of Florida bloats or expands with the production of many small cells or pockets when heated to temperatures of 1600 to 2100 degrees Fahrenheit.

A process of making a lightweight aggregate for concrete from this phosphatic volcanic ash brought patent 2,569,323 to Poole Maynard of Atlanta, Ga. In his method the ash after drying is made into pellets which are fired in a rotary kiln for about ten minutes at a temperature above 1600 degrees Fahrenheit. The bloated pellets are then crushed. The resulting product has a weight around 25 to 30 pounds per cubic foot, as compared with the usual gravel which weighs about 125 to 150 pounds per cubic foot.

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GENERAL SCIENCE

Longer Draftee Service

Based on facts of population statistics, service of three and a half years in the Army would be needed to maintain armed forces at 3,500,000 men.

► EVERY DRAFTEE will have to spend three and a half years in the Army instead of the 24 months now prescribed by the law if we are to maintain armed forces of 3,500,000 men.

This is based on the facts of population statistics as brought out by Dr. M. H. Trytten at the Engineering Manpower Convocation in Pittsburgh. Dr. Trytten is the man most responsible for the present Selective Service college draft deterrent plan, being chairman of the Selective Service committee which drafted that plan.

Charging that the military manpower planning which has taken place up to now is completely unrealistic, Dr. Trytten said that statistics on the number of men who reach 18½ years of age every year, together with the number of men who are making a career out of the service, prove that "it will be necessary to require three and one-half years of service of each one reaching 18½ years of age if we are to maintain a military establishment of 3,500,000 men."

Dr. Trytten then pointed out that the Institute of Manpower Utilization and Government Personnel said that an armed force of 3,500,000 men cannot be accomplished within the present statutory requirements and administrative policies.

"Moreover," said the Institute, "it is

essential that present statutes and policies be further amended to insure that an adequate proportion of the number coming of age each year be selected for training in the sciences, professions, and skilled crafts so as to be available for specialized service where most needed in the military forces or in civilian employment after their training is terminated."

Dr. Trytten based his figures strictly on the total number of men available each year. Only if three and one-half years service is required, his tables show, will it be possible to provide a continuing armed force of 3,500,000 men.

Earlier Dr. Trytten made the point that the American contribution in both World Wars I and II was primarily one of providing technological superiority over the enemy. He declared that, while "there need never be any depreciation of the heroic quality of American military personnel, nor of its leadership," the superiority of American arms "was primarily due to the productive capacity of the nation."

"The demand for military manpower is certain to be so great as to constitute a substantial interference with training in science and technology. Because of the extraordinarily strategic importance, even in the military sense, of training in the

sciences and technology this must be considered serious. Added to this is the fact that there exists even at the present time a sharp deficit between the supply of such (scientifically trained) personnel available and the demand for them by activities related to national security and this becomes even more clearly arresting."

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PHYSICS

Chart to Aid Autumn Camouflage of Buildings

► BETTER CAMOUFLAGE for buildings during the time leaves are changing color in the fall can be made by using a chart of autumn leaf colors prepared with aid of a partial grant from the U. S. Navy.

The chart is doubled-edged, for it can also be used to help detect on aerial photographs buildings that have been painted for disguise. Drs. Harry J. Keegan of the National Bureau of Standards and Hugh T. O'Neill of Catholic University in Washington prepared the autumn leaf color chart. They are out gathering leaves again this fall in order to make a check on their previous results.

Leaf colors for nine different kinds of trees were found for leaves running the whole possible range of colors, although the leaves were taken from the same branch of each type of tree.

Drs. Keegan and O'Neill found the changes in coloring matter were of three types: disappearance of the green pigment, chlorophyll, followed by development of a temporary red pigment, then a change to permanent brown; disappearance of green pigment, followed by development of a permanent brown; and disappearance of green pigment and simultaneous development of red pigment.

Autumn leaf colors were found for the following trees: beech, black gum, chestnut oak, dogwood, red maple, scarlet oak, sycamore, tulip poplar and white oak.

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MARINE BIOLOGY

Blue Crabs Red Tagged To Aid Migration Study

► BLUE CRABS, specially tagged with red celluloid plates, are now being "planted" near Tangier Island in the middle of Chesapeake Bay. The crabs, now two to four inches, will be able to shed without losing their tags, a big step forward in crab research.

The marked crabs will help fishery biologists in following the life, growth and migration of Chesapeake Bay's second most valuable seafood product. Fishermen finding the tagged crabs are asked to measure the crab, remove the tag and mail it to the U. S. Fish and Wildlife Service in Washington, giving the size as well as the time and place of capture.

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COLD TEST FOR JETS—To make sure that jet engines will work at the very low temperatures found high in the sky, new designs for auxiliary equipment by Westinghouse are put through a rigorous cold test in this weird appearing apparatus. The pipes are covered with crinkled aluminum foil for insulation.

PLANT PATHOLOGY

Plant Disease Control by Streptomycin Predicted

► **STREPTOMYCIN** may one day be used to control certain plant diseases.

Tests by Prof. Peter A. Ark, plant pathologist at the University of California's College of Agriculture, show this drug effective in treating seeds infected with certain bacterial diseases.

Streptomycin has controlled both bacterial speck and canker of tomato. Limited field experiments were also encouraging. Even when left in streptomycin until germination, the seeds have produced strong plants.

Streptomycin is obtained from a soil-inhabiting microorganism known as *Streptomyces griseus*. In laboratory cultures, certain products are manufactured as a result of utilization of component parts of the medium for growth requirements. These materials are extracted from the medium in which the *Streptomyces* is growing. One of these compounds is streptomycin.

Experiments are now in progress at the University of California to study further the use of streptomycin and other similar compounds from *Streptomyces* and related microorganisms in controlling diseases.

Although streptomycin has shown no control action when applied to diseased plants, such as those affected with crown gall, Dr. Ark believes that research will reveal its effectiveness.

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MEDICINE

Week-Old Babies Get Anti-TB Vaccination

► **MORE THAN** a thousand newborn babies have been vaccinated against tuberculosis at St. Mary's Maternity Hospital in Manchester, England.

The vaccination with B.C.G. vaccine has been given during the first week of the baby's life. Of 1,109 vaccinated, 820 have developed immunity according to results of tuberculin skin tests.

Results of the vaccination program are reported by Drs. Wilfrid Gaisford and Margaret Griffiths of the University of Manchester department of child health in the *BRITISH MEDICAL JOURNAL* (Sept. 22).

The aim of the program is to wipe out tuberculous meningitis in babies. This TB brain infection takes its heaviest toll during the first months of life, the doctors point out. Modern drugs are saving many from this once always fatal disease. But some 40 to 50 of each 100 who get tuberculous meningitis still die.

Immunity to tuberculosis can be given to babies in as short a time as three weeks, the doctors report. This takes a rather large dose of the vaccine, which is more

apt to produce complications. If, however, a baby has to return to a home where there is a case of tuberculosis, or if baby's mother has TB, the rapid immunization may be worth the risk of complications from the larger vaccine dose.

In answer to the question parents often ask, Is the vaccination harmless to newborn babies, the Manchester doctors answer:

Generally speaking, it is harmless, but there may on very rare occasions be harmful complications.

Science News Letter, October 6, 1951

INVENTION

Carrying Box With Launching Frame Designed for Rockets

► **ROCKET BOMBS** used on the battlefield, instead of cannon and shells, are easily carried and directly launched from a combination packing box and launching frame which was recently awarded a patent. The standard size of this expendable or refillable unit holds three of the missiles.

The packing case is a flat box-like device, made of strong wood or other lightweight material within which is an extra base of frame design hinged to the true base at one end. This frame holds the rockets. When the box is flat on the ground, the frame can be turned upward to any angle desired. Props hinged to its lower surface have ends that fit into holes on the sides of the box and hold the frame at the correct tilt.

A cross piece at the rear end of the rockets carries a pair of electrical contacts for each rocket. Suitable wiring is provided to bring the electric current to the rocket motor igniter.

Investors are Frederick C. Lindvall, Altadena, and Paul E. Lloyd, Pasadena, Calif. Patent 2,568,455 was awarded to them. Rights have been assigned to the United States as represented by the Secretary of the Navy.

Science News Letter, October 6, 1951

VETERINARY MEDICINE

Squirrels' Blood Clotting Changes With the Season

► **THIN BLOOD** for the summer sleeping, or dormant, period and blood that clots faster for cold weather activity is the rule for ground squirrels and perhaps other animals that lie dormant in their nests in summertime.

In the dormant state, the animal's heart beats very slowly, so blood that clots slowly is an advantage. When the animal is active and exposed to injury, blood that clots quickly is an advantage.

This natural protective mechanism in the blood of ground squirrels was discovered by Drs. Arthur Svihla, Howard R. Bowman and Ruth Ritenour of the University of Washington at Seattle. They report their findings in the journal, *SCIENCE* (Sept. 21).

Science News Letter, October 6, 1951

IN SCIENCE

PLANT PATHOLOGY

Deadly Oak Disease Hits Michigan's Trees

► **OAK WILT**, the deadly disease that threatens oak trees over the eastern half of the nation, has now been found in Michigan for the first time.

The disease was spotted in a dying red oak tree in Cass County in southern Michigan. An aerial survey later revealed that trees in six other counties of the state were infected.

Oak wilt is caused by a deadly fungus, *Chalara quercina* Henry, which lives in the outer rings of wood tissue just beneath the bark. It is known that the disease moves through root grafts to other oaks in the area but how it travels greater distances is not known.

The infected trees were spotted by Prof. Forrest C. Strong of Michigan State College in East Lansing.

Science News Letter, October 6, 1951

MEDICINE

Yellow Fever Outbreak In Costa Rican Jungle

► **AN OUTBREAK** of jungle yellow fever in Costa Rica, the first occurrence of this kind of yellow fever in that Central American country, took Dr. Fred L. Soper, director of the Pan American Sanitary Bureau, on a flying trip down to size up the situation personally.

The outbreak in itself is not considered serious. Since its beginning in June, only 2 cases have been reported to date. The local government, with the cooperation of the United States, the Pan American Sanitary Bureau and the yellow fever vaccine laboratory at Bogota, has the situation well in hand.

But Dr. Soper is an old yellow fever fighter. Report of an outbreak is like the clang of the bell to an old fire horse. And in this Costa Rican outbreak, Dr. Soper sees fresh ammunition for his current fight to get all American countries, including the United States, to wipe out the dangerous *Aedes aegypti* mosquito, carrier of yellow fever in cities.

Jungle yellow fever lurks as an animal and human disease in the jungles. Persons going into the jungle can be protected by vaccination. But an unprotected person coming out of the jungle with yellow fever virus in his blood can be the starting point of a dangerous outbreak any place where *Aedes aegypti* still buzzes and bites.

Science News Letter, October 6, 1951

SCIENCE FIELDS

MEDICINE

Rotating Patient Improves X-Ray Treatment of Cancer

► A GROUP of patients who two years ago were dying of cancer are today "walking around," apparently well, thanks to treatment with a special two-million-volt X-ray machine and a rotation method of using it.

Whether these patients are "cured" or not cannot be told for another three years or more. But the promising results and the additional lease of life given them can be extended to patients in other parts of the country because this X-ray machine, though large and fairly costly, can be installed in any hospital with a room of conventional size for deep X-ray treatments and 12-inch concrete walls for protection of personnel.

This two-million-volt machine, developed by Dr. Robert Van de Graaff of Massachusetts Institute of Technology, was among the many cancer-fighting weapons shown at the meeting of the American Roentgen Ray Society in Washington.

Object of such a supervoltage machine is to get as much as possible of the killing X-rays into the cancer within the patient's body in a way that spares the skin and tissues between the skin and the cancer.

The very fine focal spot of this Van de Graaff machine plus a rotating chair in which the patient sits combine to cut down scattering of the rays with consequent skin reaction. As a result, a 100% dose of radiation is delivered to the cancer area in comparison to a 10% dose just below the surface of the skin.

Science News Letter, October 6, 1951

TECHNOLOGY

Glass Fiber and Plastic Fabric Resist Bullets

► GLASS FIBER and plastic layers are the materials used in bullet-stopping jackets now being tested by Medical Corps litter men on battlefields in Korea. Designed to stop low velocity shell fragments and bullets, they are capable of stopping a .45 caliber bullet at pointblank range.

The jackets themselves are made of cotton, and they cover the body, including the lower part of the abdomen, but leave the arms free. The protective material, one-eighth inch thick, is made in panels which are inserted in pockets all over the sleeveless garment. Some panels are flat. Others are shaped to fit the conformations of the body.

Another jacket, more flexible than this, is made of several layers of nylon fabric

pressed together. The heaviest models cover the entire body trunk as well as the shoulders and upper arms. Field testing of this and the first mentioned type are to be made with and without a sponge rubber layer on the inside next to the body. The purpose of the rubber layer is to lessen the shock made by a missile when it hits the protective clothing.

This armored clothing, as it is called, is a development of the U. S. Army's Quartermaster Corps. In addition to the jackets is a new helmet made of laminated nylon which seems to have greater resistance to missiles than present steel types. A shell of aluminum is worn over the nylon affair which adds to its ballistic properties. When not needed on the head, the shell can be used as a water container.

Science News Letter, October 6, 1951

INVENTION

Lumber Dried Rapidly Using Hot Air and Electric Power

► A METHOD of drying green lumber, using hot air followed by high frequency electric power, brought Harold P. Wood, North Berwick, Me., patent 2,567,983. Rights are assigned to Wood Electro Process Company of South Berwick, Me. Time required for drying is much shortened over conventional processes, and neither distortion nor discolorization results.

Science News Letter, October 6, 1951

MEDICINE

Artificial Heart and Lung Use Predicted Within Year

► REPLACEMENT for two vital parts of the human body, the heart and lungs, may go into operation on a human patient in the near future, possibly within the next year, Dr. John Gibbon of Jefferson Medical College, Philadelphia, predicted at a National Institutes of Health symposium in Washington.

These mechanical replacements would be temporary only but they could be life-saving. They would be used to keep oxygen-rich blood circulating through the body of a patient having a heart operation. With their aid, blood would by-pass the natural heart and lungs, thus giving surgeons a dry field of operation for seeing and feeling as they operate. New heart and chest operations and improvements on older ones might be devised.

Dogs have been kept alive for over an hour with a mechanical heart-lung apparatus to do their breathing and blood pumping, thus enabling surgeons to operate successfully on their hearts.

Research efforts to perfect artificial hearts and lungs has currently been awarded \$89,893 in grants from the National Heart Institute.

Science News Letter, October 6, 1951

PLANT PATHOLOGY

Hormone Chemical Checks Virus on Tobacco Plants

► A GROWTH hormone used to stimulate rooted cuttings will check tobacco mosaic virus infections in tobacco.

Thomas E. Rawlins and R. J. Kutsky of the University of California College of Agriculture's division of plant pathology in Berkeley found naphthalene acetic acid holds down reproduction of this virus to about one-third of the amount found in untreated plant tissue.

Some yet unknown chemical action of the hormone keeps the virus from multiplying at a normal rate.

Virus concentrations were determined by the amount of ultraviolet light absorbed. This new method was also developed in the division of plant pathology. Ultraviolet absorption tests are made after the virus is removed from the infected plants.

Further work is now under way to test this hormone on field grown plants and to discover new virus inhibiting materials.

Science News Letter, October 6, 1951

GENETICS

Honey Bees Bred With Eyes of Various Hues

► CHOOSE a color, any color, and Prof. Harry H. Laidlaw of the entomology division on the Davis campus of the University of California will hand you a honey bee with eyes to match it. Well, almost.

Honey bees ordinarily have black eyes, but Prof. Laidlaw has produced young bees with eyes of various hues. So far he has turned out bees with eyes two shades of red and chartreuse, dark brown, cinnamon, chamois and buff, with intermediate shades, not to mention the blue-eyed type he reported a year or so ago.

Eye color is one of the mutations—changes that occur in the genes of plants, animals, and insects under natural selection—being studied at the Davis apiary.

A selected eye color is being used as a marker that may be followed from one generation to another. A knowledge of how the gene for color is inherited may provide a key to the inheritance of some of the less spectacular but important economic factors in which the grower is interested.

For the researcher, the knowledge is of value in studies of sex determination and certain embryological processes in the bee.

The project at Davis is the most extensive genetic study ever undertaken with the honey bee. Its ultimate objective is to develop bees that will be better producers of honey and better pollinators of California's crops.

Along the way, the geneticists are attempting to add gentleness, longevity, non-swarming tendencies, good comb building, and resistance to disease.

Science News Letter, October 6, 1951

GENERAL SCIENCE

Discover Scientists of Future

So far 3,000 top potential scientists have been discovered in ten years of the Science Talent Search. Nation desperately needs to find more for defense research.

See Front Cover

By WADSWORTH LIKELY

► IN TEN YEARS, the number of scientists employed by industry has doubled. In the same period the number of scientists and engineers employed in defense establishments has multiplied ten times. And in the next ten years, the trend will continue upward.

In 1950, there were 75,000 college graduates in scientific fields, in 1951, only 47,000. For the next ten years, the trend will continue downward.

It is the considered opinion of most people that this nation can defend itself from Communist aggression only by maintaining a great technological superiority over the Soviet Union and its satellites. This technological superiority must be based on the knowledge and findings of an ever-increasing number of scientists and engineers. Therefore, everything which promotes the idea of science among young people promotes this nation's defense.

One significant movement which ferrets out new scientists is the annual Science Talent Search, organized and managed by SCIENCE SERVICE through Science Clubs of America and sponsored by the Westinghouse Educational Foundation.

Now Is Time to Enter

Right about now, high school seniors in all parts of the nation are planning to enter the Eleventh Annual Science Talent Search. More than 15,000 of them, if other years are criteria, will have the opportunity of taking the Science Talent Test, the first of four hurdles which the youngsters will have to jump.

Only about 2,000 of them will complete this grueling test, designed to do part of the job of finding potential science talent among the nation's high school seniors.

Every high school in the nation, every sponsor of the more than 15,000 science clubs, receives notice of this year's Science Talent Search. They are urged to make this opportunity known to their seniors. The sponsors of the search hope, in this way, to make thousands of youth aware of the potentialities of a science career.

For direct stimulation there is the prospect of a fabulous five-day visit to Washington for the 40 top winners and \$11,000 in scholarships awarded at the Science Talent Institute held during this trip. There is the certainty that dozens of col-

leges and universities will, on their own, offer thousands of dollars more in scholarships. These offers go not only to the top 40 winners but also to most of the 260 other seniors who receive honorable mention in the Science Talent Search.

And more and more states are holding their own Science Talent Searches. This year, 23 states will take the final results on all students who complete their entries in the national search and hold their own supplementary competitions. More scholarships will be awarded on a state-wide basis.

But, perhaps, the indirect benefits to the nation will be even greater. Thousands of students besides the 15,000 who enter the Search will be stimulated to study science when they go to college. Success of a classmate, the knowledge that large national organizations are seeking scientific talent will give them the motive to go into the fields of science, technology and engineering after they graduate from high school.

For those who do enter the Science Talent Search, the road is rough. Of the 15,000 who send for the two-and-a-half-hour test,

only about 2,000 complete it. The tests are all given during the same period in December. Thorough evaluations by teachers, and complete records of the marks made by the students, including their class standing, must accompany the completed tests.

Report on Science Project

Last, but most certainly not least, each student must write a report on "My Scientific Project." These range from studies of photographs of the tracks of cosmic rays to a detailed description of the tasks involved when one 17-year-old built a cyclotron. A California girl reported on the geology of the Sierra Nevadas, drawing on knowledge gained from field trips which included climbing Mount Whitney, this country's highest. A New York girl studied the confused flour beetle, called confused not because of its way of life but because it is easily confused with a similar beetle.

The reports are detailed, intelligent and sometimes show results of surprisingly original work. They are read carefully—usually during the Christmas week—by a board of judges at SCIENCE SERVICE.

On the basis of the reports, the tests, the marks and the teachers' evaluations, the 40 who will come to Washington at the end of February and the 260 honorable mentions are chosen.



TALENT SEARCH WINNERS—Robert Leonard Hall, left, of West De Pere, Wis., Science Talent Search Winner in 1945, is shown here working on an archaeological project. He is a University of Wisconsin graduate now studying for his doctor's degree. At right, Gilbert S. Daniels of the Wright-Patterson Air Force Base in Ohio, a 1944 winner and Harvard graduate, measures the head of one of more than 5,000 Air Force personnel in a study to provide better designs for flight equipment.

The day the announcement of the winners is made is a great one for the student. But it is also a great one for his teachers and for the school he is attending. High schools are as proud of a Science Talent Search winner as they are of the football heroes.

The trip to Washington for the 40 winners provides five days of excitement, intellectual and otherwise. For one thing, the \$11,000 in Westinghouse Science Scholarships must be distributed. The top winner receives \$2,800 and the runner-up, \$2,000. Everybody receives at least \$100.

Four Judges for Scholarships

Four men judge the distribution of these scholarships: Dr. Harlow Shapley, president of the SCIENCE SERVICE Board of Trustees and director of the Harvard College Observatory; Dr. Harold Edgerton, vice-president, Richardson, Bellows, Henry & Co., New York; Dr. Stuart Henderson Britt, vice-president and director of research, Needham, Louis & Brorby, Inc., Chicago, and Dr. Rex E. Buxton, Washington psychiatrist. Drs. Edgerton and Britt devise the tests each year.

When they are not being interviewed by the judges, the winners may well be being interviewed by representatives of the press. There is a formal program laid out for them which includes visits to the scientific laboratories in defense establishments and government departments, talks with noted scientists and a visit with the President of the United States. The scholarship winners are announced with a great deal of suspense at the annual banquet which concludes the five-day Science Talent Institute.

The boys and girls who attend these Institutes come from all over the nation. Most of them are leaders in their schools, holding offices in their classes and school organizations. Some are athletic stars, a high proportion play musical instruments—there is usually at least one jam session during the Washington visit.

They are normal in every way except that they have more knowledge of science and much more of a drive to do scientific work than do their classmates. Some of them like the five-day visit because for the first time they meet people "like themselves" in this respect.

In the fall of 1951, almost ten years after the first 40 winners were picked in 1942, all but two are working in scientific, technical or engineering fields. One of these two is a political scientist, the other a retired chemist now a wife and mother. Six are Ph.D.'s, eight are doctors of medicine, almost half hold masters degrees, their equivalents or better. In the class of 1943 there are six Ph.D.'s.

The search is spreading the interest in science, too. Every year more than half the winners come from schools which have never before placed. The state Science Talent Searches grow, in numbers of states and in numbers of scholarships offered, every year.

On the cover of this week's SCIENCE NEWS LETTER, Paul Sternberg, top 1950 Science Talent Search winner, is shown at work in the Brookhaven National Laboratory of Associated Universities, Lipton, Long Island, N. Y. Now an 18-year-old sophomore at Swarthmore, Pa., during the past summer he examined tracks made by nuclear particles in photographic emulsions exposed to cosmic rays at high altitudes.

Meantime, the students go on with their careers. Last year's winners are just starting their first year in college, while the early groups are already involved in advanced research. They hope, and the nation does too, that more of our young men and women will join them in scientific careers. Confronted by a long-sustained crisis, the nation can certainly use them.

For complete details of the national and state Science Talent Searches, write to Science Clubs of America, 1719 N. St., N. W., Washington 6, D. C.

Science News Letter, October 6, 1951

INVENTION

Radio Beacon Will Guide Plane by Coded Signal

➤ A WARTIME-DEVELOPED radio beacon for guiding airplanes in flight by a coded signal sent out in response to a signal from the plane brought patent 2,568,265 to Luis W. Alvarez of Belmont, Mass., with rights assigned to the U. S. Navy.

The radio beacon, designed to be located at an airport or on an aircraft carrier, is normally inoperative but may be triggered from remote points by radio signals. It will fire only when it receives a signal of a predetermined character, and then it will send out a single high-speed coded signal which permits the pilot to identify the beacon.

In the system, the coded signals sent out from the beacon are received by special instruments in the plane in which they are translated into light impulses on the face of a cathode ray tube, so that the code will actually be visible and instantaneously observed. This enables the pilot at a glance to know the direction of the beacon from the plane as well as its distance away.

Science News Letter, October 6, 1951

TECHNOLOGY

Concrete Now Made With Corncob or Air

➤ FARMERS WHO want a lightweight concrete for farm buildings can now utilize in making it either one of two plentiful farm materials—corn cobs or air.

Both types of concrete are being made, the U. S. Department of Agriculture reports, but much work must be done before they are ready for general use. The first uses corncob pellets as filler or aggregate, the second is filled with bubbles of air.

The corncob concrete is being developed at the Michigan State College, East Lansing, in cooperation with the federal department. The pellets used are about three-eighths of an inch in diameter and replace ordinary aggregate. Before mixing with the cement, water and sand, the corncob pellets are soaked in water for hours. Otherwise they will absorb the water in the mix and cause the concrete to rupture in setting.

An improved air-containing concrete, suitable for farm use, has been developed by the National Bureau of Standards. Officially it is called air-gravel concrete. Gravel is used as the aggregate, but air replaces all or part of the sand. The air bubbles are created in the mix by the use of chemicals called air-entraining agents.

Science News Letter, October 6, 1951

SPINOZA DICTIONARY

Edited by Dagobert D. Runes

IN this work, Baruch Spinoza, one of the cardinal thinkers of all time, answers the eternal questions of man and his passions, God and nature. In the deepest sense, this dictionary of Spinoza's philosophy is a veritable treasury of sublime wisdom.

Here is what Albert Einstein writes about this book:

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Hackberry

► ONE OF the most widely distributed of American forest trees, even though not an especially abundant one, is the hackberry. Its several New World species range from southern Quebec westward as far as Washington and Oregon and southward into Texas and Florida.

On the Atlantic seaboard it is not very plentiful, but scattered specimens keep one reminded of its presence. It prefers the deep rich soil of moist river terraces, though it will grow well in cultivation almost everywhere.

It is really a handsome tree, with straight, clean-cut trunk usually a foot or so in diameter, though occasionally reaching as much as three or four. The bark is unmistakable—rough, ridged, pebbly. No other tree has a bark quite like it. The twigs are fine and slender, often afflicted with the fungus disease known as witches' brooms. The leaves are more or less like those of the elm, to which the tree is rather closely related.

The hackberry is used occasionally as a street tree, although its trick of striving for height without branching trunk does not make it a favorite for that purpose. No planting scheme should ignore it entirely, however, because it is one of the most characteristic American trees.

Where conditions are favorable, its straight, rough barked trunk lifts its crown

of dark-green leaves 80 feet or more into the air. In drier places its height will not reach more than half that, but the tree nevertheless maintains its upright, sturdy, symmetrical growth.

Because of its scarcity in most parts of the country, it has but little use as lumber. The wood is heavy and soft, without much strength, but yields itself readily enough to working. It finds some utilization in the making of cheap furniture, boxes, loose barrels, and similar more or less lowly occupations. But it is better left alive than killed for such nondescript ends.

There is a second species of the tree in this country, the Mississippi hackberry; it is more strictly confined to the wet river bottoms. It is distributed along the great river and its principal tributaries, as well as in other parts of the South, but does not leave the streambanks when it invades the North.

A third species, which most of us would pass up as a mere bush or imperfect example of one of the other two, is found occasionally, especially in the South.

The name of the tree might seem at first to promise something choice in the way of fruit, but any expectations of that sort would be doomed to disappointment. The tree bears berries, but they are 99% stone and 1% pulp—only a hard round seed with a skin pulled over it.

Science News Letter, October 6, 1951

MEDICINE

10 Viruses Range Globe, May Have Common Ancestor

► A GROUP of about 10 viruses, all related in unique but complicated ways, ranges over almost the entire globe.

Many of them can cause severe sickness in man and his domestic animals.

Regions of the world included in their range are eastern Asia, Japan and many of the Pacific Islands, the United States, Central Africa, the United Kingdom, Central Europe, Colombia and Brazil.

These 10 world-ranging viruses may all come from a common stock, or ancestor. They are all about the same size. In most cases they are carried to man and domestic animals by infected mosquitoes. In every instance, however, there is probably some wild reservoir in nature.

Monkeys play a prominent role as reservoir for the yellow fever virus. Various birds are involved in four kinds of encephalitis, the brain disease sometimes called sleeping sickness. Besides the birds involved as reservoirs in St. Louis, eastern and western equine (horse) and Russian encephalitis, rodents have been incriminated in Russian encephalitis.

A systematic study of new viruses found in South American and African forests has been carried on by the International Health Division Laboratories of the Rockefeller Foundation.

Science News Letter, October 6, 1951

INVENTION

Better Iron Castings Made By Adding Metal Alloy

► BETTER castings of iron are promised by use of an alloying composition on which a patent was granted recently. The addition of this composition changes the molecular structure of castings to give a finer and more uniform grain.

The inventor is Frank Alden Miller, St. Petersburg, Fla. Patent 2,563,056 was issued to him. Rights are assigned to H. J. Dion Company, a corporation of Michigan.

Science News Letter, October 6, 1951

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ACTIVITY PERIOD IN PUBLIC HIGH SCHOOLS—Ellsworth Tompkins—*Govt. Printing Office*, 17 p., paper, 15 cents. Information and statistics on how high schools organize the time devoted to the activity period. Bulletin No. 19 of the Office of Education.

AIR WAR AND EMOTIONAL STRESS: Psychological Studies of Bombing and Civilian Defense—Irving L. Janis—*McGraw-Hill*, 280 p., \$5.00. Results of research by the Rand Corporation for the Air Force including evaluation of the psychological effects of bombing at Hiroshima and Nagasaki and suggestions of what can be done toward education for survival.

THE ALGEBRA OF VECTORS AND MATRICES—Thomas L. Wade—*Addison-Wesley*, 189 p., \$4.50. Text for a first course in modern algebraic theory.

ANIMAL TOOLS—George F. Mason—*Morrow*, 94 p., illus., \$2.00. Describing such tools as the drills of insects, the cleaning kit carried by bees, the gyroscope of the fly and the powder puff and comb of the biter.

ARIZONA FLORA—Thomas H. Kearney, Robert H. Peebles, and others—*University of California Press*, 1032 p., illus., \$7.50. To afford means for identifying the approximately 3,370 species growing wild in Arizona.

ARTHRITIS: What You Can Do About It—Robert D. Potter—*Dodd, Mead*, 239 p., \$2.75. To tell patients and their families what medical science has to offer for this extremely painful illness. By a science writer.

BEGINNER'S GUIDE TO ATTRACTING BIRDS—Leon A. Hausman—*Puunam's*, 127 p., illus., \$2.00. With directions for making at home bird baths, houses, feeding stations and other devices for attracting feathered visitors to your garden.

BRITISH AIRCRAFT: A Pictorial Survey—*British Information Services*, 35 p., illus., paper, free upon request to publisher, 30 Rockefeller Plaza, New York 20, N. Y. Excellent photographs of the jets and other latest-type planes made in Britain.

CAREERS IN FORESTRY—Forest Service—*Govt. Printing Office*, USDA Misc. Pub. No. 249,

22 p., illus., paper, 15 cents. One third of the United States is forest land. The job of the forester is the management of wild lands so that they will be permanently and continuously productive.

CALCULUS AND ANALYTIC GEOMETRY—George B. Thomas, Jr.—*Addison-Wesley*, 685 p., \$6.00. The reader is expected to know high school algebra, plane and solid geometry and trigonometry.

CONSUMER'S STAKE IN TEXTILE PROCESSING—Jules Labarthe, Jr.—*Mellon Institute*, 3 p., illus., paper, free on request to publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa. Discussing the demands made by the consumer on textile finishes.

THE DEPARTMENT OF STATE TODAY—Department of State—*Govt. Printing Office*, 33 p., illus., paper, 15 cents. Describing the organization and functions of the State Department, including the working of the Marshall Plan and Point Four.

FUNDAMENTALS OF ELECTRONICS—F. H. Mitchell—*Addison-Wesley*, 242 p., illus., \$4.50. As instrumentation grows in importance, electronics penetrates more and more into other branches of science. This text lays a foundation for electronics students and shows others how electronics may be applied in other branches.

FUNDAMENTALS OF SEMIMICRO QUALITATIVE ANALYSIS—Erwin B. Kelsey and Harold G. Dietrich—*Macmillan*, rev. ed., 328 p., illus., \$4.00. Designed to provide correlation of theory with actual laboratory practice.

GARDEN SPIDER—Mary Adrian—*Holiday House*, 38 p., illus., \$2.00. A simple account for children of the life cycle of an interesting garden resident. Attractive illustrations in color.

HOW TO HAVE A BABY: Techniques for Fertile Marriage—Robert A. Klein and B. J. Schuman—*Hermitage*, 224 p., \$2.50. Suggestions to the estimated 4,500,000 childless couples for whom parenthood is possible on what they may do to overcome their lack of fertility.

HOW TO STUDY, HOW TO SOLVE, ARITHMETIC THROUGH CALCULUS—H. M. Dadourian—*Addison-Wesley*, 121 p., illus., paper, 60 cents. Intended to overcome the fear and mystification associated with advanced mathematics.

THE HUMAN SIDE OF INDUSTRY—*Industrial Hygiene Foundation*, 102 p., illus., paper, \$2.00. The transactions of the 15th annual meeting of the Foundation.

AN INTRODUCTION TO ACOUSTICS—Robert H. Randall—*Addison-Wesley*, 340 p., illus., \$6.00. A textbook for the student who has completed a general college course in physics. Includes chapters on musical instruments.

IODINE: Its Properties and Technical Applications—*Chilean Iodine Educational Bureau*, 74 p., paper, free upon request to publisher, 120 Broadway, New York 5, N. Y. Describing important uses of iodine in organic chemistry and industry.

LABORATORY MANUAL FOR GENERAL ZOOLOGY—Tracy I. Storer—*McGraw-Hill*, 2nd ed., 150 p., illus., \$2.50. Includes instructions for making dissections.

MAGNETIC RESULTS FROM HUANCAYO OBSERVATORY, PERU—P. G. Ledig and others—*Carnegie Institution of Washington*, 127 p., illus., paper, 75 cents, cloth, \$1.50. Presenting data from this observatory 11,000 feet above sea level.

MAGNETIC RESULTS FROM WATHEROO OBSERVATORY, WESTERN AUSTRALIA—W. C. Parkinson and others—*Carnegie Institution of Washington*, 127 p., illus., paper, 75 cents, cloth, \$1.50.

MATHEMATICS OF FINANCE—Albert E. May—*American Book*, 264 p., \$3.00. Giving a foundation in theory with a few simple, important formulas which can be adapted to many types of problems.

MIDDLE CAMBRIAN STRATIGRAPHY AND FAUNAS OF THE CANADIAN ROCKY MOUNTAINS—Franco Rasetti—*Smithsonian*, 277 p., illus., paper, \$2.50. Describing an area famous for the great development, high fossil content and splendid exposures of the entire Cambrian system.

THE MUSEUM: New Jersey Minerals in the Museum Collection—Harold R. Magnuson—*Newark Museum Association*, 16 p., illus., paper, 50 cents. Historical notes on man's use of minerals, especially in New Jersey.

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RESIDENCE AND MIGRATION OF COLLEGE STUDENTS, 1949-50—Robert C. Story—*Govt. Printing Office*, Misc. No. 14, Office of Education, 61 p., paper, 35 cents. In the past 20 years, there has been practically no change in the proportion of students going outside their states to college.

THE SOUTH AMERICAN HANDBOOK 1951—*Trade and Travel Publications (H. W. WILSON)*, 770 p., maps, \$1.50. Travel information, including climate, transportation, hotel facilities, politics and food.

TRANSACTIONS OF CHEMICAL-ENGINEERING CONFERENCES: Fifteenth Annual Meeting—*Industrial Hygiene Foundation*, 45 p., illus., paper, 75 cents.

WHAT'S THE WORLD COMING TO? Science Looks at the Future—A. M. Low—*Lippincott*, 214 p., illus., \$3.00. A British scientist and inventor dips into the future and foresees an amazing world. Published in England under the title "It's Bound to Happen."

Science News Letter, October 6, 1951

Hens exposed to invisible ultraviolet light lay from 10% to 19% more eggs than birds under normal conditions.

STOP SAYING THAT TRAVEL IS TOO EXPENSIVE

Passenger-carrying freighters are the secret to low cost travel

Yes, for no more than you'd spend at a resort, you can take a never-to-be-forgotten cruise to Rio and Buenos Aires. Or through the Canal to either New York or California. Or to the West Indies or along the St. Lawrence River to French Canada. In fact, trips to almost everywhere are within your means.

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PHYSIOLOGY

Moving Makes You Shiver

► SCIENTISTS HAVE not made up their minds yet whether you are better off just sitting still when you are cold, or whether you ought to get up and move about a little.

One thing is certain, though; you're more likely to shiver if you do move about. This has been shown by two Cambridge University scientists, Drs. E. M. Glaser and R. V. Holmes, who report some experiments they did on shivering in *THE JOURNAL OF PHYSIOLOGY*.

The doctors collected nine healthy men ranging between 20 and 37 years in age and got them to sit with their feet and legs in tubs containing about 15 inches of water cooled down to between 45 and 55 degrees Fahrenheit.

As long as the men just sat quietly they did not shiver, even after an hour and one-half of the cold foot baths, but they all shivered within 4 to 17 minutes after the cooled limbs were exercised, regardless of how long they had been cooled.

The doctors explain this as due to the fact that the blood flow through cooled

muscles is cut way down, so that the amount of cold blood flowing up through the legs into the body is small while the legs are cool. However, exercise of the muscles greatly speeds up the flow of blood and the cold blood which then pours from the legs into the general circulation would seem to stimulate a shivering reflex center.

Drs. Glaser and Holmes say: "It would be tempting to conclude now that slow exercise in a cold place is also a bad thing because it increases the blood flow to cold extremities. Mild exercise, however, causes shivering, and this may more than counteract the augmented loss of heat."

The latter is the case because the work done by the muscles in shivering generates heat so that, as the doctors put it, "it cannot, thus, be predicted whether a person who is cold would gain or lose heat if he moved about a little."

Of one thing they are certain: that hard exercise "is certainly an advantage during severe cooling."

Science News Letter, October 6, 1951

ENTOMOLOGY

Set Up Insect Ellis Island

► A WEST Coast "Ellis Island for Insects" has been set up at Albany, Calif., to handle the safe importation of beneficial insects.

The imported "bugs that fight bugs" are liberated to fight against the agricultural pests which have reached California from foreign countries, having left their natural enemies behind.

For nearly 30 years the University of California's Division of Biological Control has maintained quarantine quarters at Riverside in the southern part of the state.

The establishment of the Albany unit provides additional facilities to test insects that may control agricultural pests in central and northern California. The location is close to steamship and air terminals at San Francisco.

Opened recently, the quarantine laboratory has already received collections from all over the world: parasites of the olive scale from India and Pakistan, parasites of the elm scale and fig scale from France, a small ladybird beetle from Australia which preys on mites.

The quarantine material is handled by the University's College of Agriculture through agreement with the United States and the California State Departments of Agriculture. It is the only state institution in the United States granted quarantine privileges because of its trained personnel and especially-designed facilities for quarantine work.

The new Albany quarantine building is absolutely insect-proof with double windows, smooth walls and ceiling, doors with gasket sealing and an entry system through an ante-room. The quarantine wing is locked at all times and access is restricted.

The facilities at Albany are designed to speed up or retard the rate of development of insects by individual temperature controls in each room. At times this is a factor in handling insects from the southern hemisphere which are conditioned to seasons just the opposite of those in California. Temperature controls for growth-regulating are also useful in breeding insects with complex life histories.

Science News Letter, October 6, 1951

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Your voice in Davy Jones' locker

To strengthen voices in the newest submarine cables between Key West and Havana amplifiers had to be built right into the cables themselves. With the cables, these amplifiers had to be laid in heaving seas; and they must work for years under the immense pressure of 5000 feet of water.

For this job, Bell Laboratories engineers developed a new kind of amplifier — cable-shaped and flexible, with a new kind of water-tight seal.

To serve far beyond reach of repair, they developed electron tubes and other parts, then assembled them in dust-free rooms.

The two cables — each has but two conductors — simultaneously carry 24 conversations as well as current to run the electron tubes.

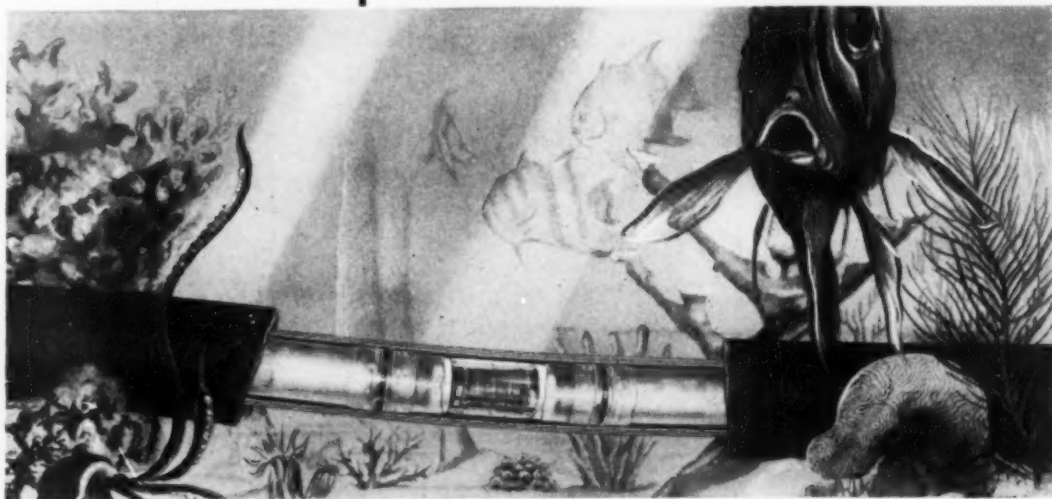
With these deep-sea amplifiers, submarine cables carry more messages . . . another example of how research in Bell Telephone Laboratories helps improve telephone service each year while costs stay low.

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Cutaway view of deep-sea amplifier. Tubes and other elements are housed in plastic cones then enclosed in interleaved steel rings in a copper tube. Glass tape, armor wire and impregnated fiber complete the sheath.



• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 590. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

☼ **RAIN HAT**, umbrella-size and made of a plastic sheeting, is an inflatable affair held extended by a tire-like tube around the rim which is blown up by mouth when the owner gets caught in a storm. When collapsed, it folds to a cigarette-size package, easily carried in a handbag.

Science News Letter, October 6, 1951

☼ **HAT-HOLDER** for the automobile is a rayon elastic band which, with the aid of four pin hooks inserted in the upholstery or ceiling lining, forms an open rectangle to hold the hat by its brim. The elastic has stretch enough to permit easy insertion and removal.

Science News Letter, October 6, 1951

☼ **PIPE FILLER**, for the smoker, is a plastic tubular affair that forms the bottom of a tobacco pouch and into which tobacco from the pouch passes. A plunger at one end pushes the "weed" as needed out the other end and into the bowl of the pipe without spilling or contamination.

Science News Letter, October 6, 1951

☼ **WINDOW PANE holder**, a recently patented device to replace the putty ordinarily used to hold the glass in the sash, is a metallic strip having a body portion of V-shaped cross section which fits into a slot in the sash. Rubber behind the strips makes a tight joint.

Science News Letter, October 6, 1951

Do You Know?

Some 19 metals in very small quantities are contained in the various grades of beef; called *trace elements* because they are found in traces, these essentials run from aluminum and boron to tin and zinc.

There are probably more *quail* and rabbits in parts of America today than there were before the white man came; both thrive better under conditions of modern agriculture.

The greatest depth of *water* in the Great Lakes is 168 fathoms at a position in Lake Superior.

Only five *icebergs* during the 1951 ice-berg season are known to have drifted south of the 48th parallel, approximately the southern limit of Newfoundland; such a low number is unprecedented.



☼ **EXPOSURE METER**, match-box size and designed particularly for use in taking colored pictures, is shown in the picture. The device is merely pointed at the subject or scene and gives the correct camera setting directly from a scale on its face. No

conversions, calculations or special readings are required.

Science News Letter, October 6, 1951

☼ **ROLLAWAY CARTS** for use about the home in the kitchen, laundry, lawn or garden resemble the familiar carts used in supermarkets and are sturdy enough to carry a load of dishes or a basket of wet wash. They are easy-rolling, lightweight, and are collapsible for small-space storing.

Science News Letter, October 6, 1951

☼ **BLANKET SHELF** for beds, recently patented, is a flat framework to insert between mattress and springs at the foot of the bed. The shelf can be pulled out when desired to hold a blanket or other object, a lug preventing complete withdrawal.

Science News Letter, October 6, 1951

☼ **"PHOTOANGULATOR"** is an instrument developed by Army engineers to give true horizontal directions from oblique aerial photographs. The three-arm device is set over the oblique photo, and one arm adjusted to the angle of the camera at time of exposure. Another gives the true horizontal directions.

Science News Letter, October 6, 1951

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